

# Sand Sports Fields: Making the Decision

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**S**and carpet sports fields have been built throughout New Zealand, providing surfaces for a variety of sporting codes. The objective of this article is to review the main considerations when making the decision to install a sand carpet field.

Stakeholders of a sports field venue need to be aware of, and understand, the implications of the decision to install a sand carpet field. This will ensure that:

- 1) Stakeholders have realistic expectations of the project and the field's final performance and sustainability.
- 2) Planning the installation of the sand carpet field and associated drainage proceeds in a logical manner, with site investigation work undertaken and the feasibility of all upgrading options considered.
- 3) Clubs are committed to providing the increased maintenance budget and trained turf managers (or management advice) to ensure the continuing success of the upgraded field.

## Stakeholders Requirements and Expectations

### Field Use

In managing sports fields, it is the 'sustainable level of use' which must be considered. The sustainable level of use is defined as 'that which gives the maximum use of a ground without causing an unacceptable reduction in playing quality.' Auckland City, which manages approximately 40 slit-drained, sand carpet fields reports average increases in use of 100%. Despite this impressive statistic, it must be remembered that sand fields cannot cope with unlimited hours of use and are difficult and expensive to repair once damaged.

A slit-drained, sand carpet sports field is designed to allow surface water to drain quickly after rain stops. It can be expected to be used more quickly after rain than a soil-based field, where the surface may remain wet for days.

Like soil fields however, sand carpet fields must be managed under a sensible usage policy. Clubs must be encouraged to actively control field usage, closing



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fields while surface water remains on grounds or where cover becomes sparse. They must discourage unbooked play and rotate practice areas to ensure the continuing success of their sand carpet field.

For some regions, increasing pressure from sports groups for more sports fields is a main influence in the decision to install a sand carpet. For example, Auckland is predicted to grow by 20% in the early years of the 21<sup>st</sup> century, so in theory, Auckland City will also need at least 20% more sports fields. There is, however, little land available in the central city to accommodate this growth, so sand fields must be considered to increase the hours of play per field.

### Playing Surface Quality and Reliability

Even under low use, sports administrators, who must ensure their venue is not turned down for major games or events, will often select a slit-drained, sand carpet installation. The sole reason for this choice is often that their facility must be of a high standard under most weather conditions, with the risk of postponement minimized.

## Construction

### Construction Costs

Sports administrators often ask the question: "How much will it cost to construct a sand carpet sports field?" In answering this it must be pointed out that all sites are not equal and the availability of suitable materials and design options must be assessed. In addition, the expectations of stakeholders in terms of the quality of the playing surface and the amount of sustainable use must be determined. This in turn will influence cost.

It is unwise to quote a figure taken from the cost of another construction until a feasibility study of the site has been undertaken and design options have been assessed. This preliminary work should be undertaken prior to making the decision to install the drainage system and prior to the preparation of funding applications.

### Site Considerations

A comprehensive site assessment must be made in order to determine requirements to upgrade a soil sports field to a sand carpet field. Examples of key features to assess include: the contour of the site, the soil profile, the presence of any existing sub-surface drains, the location of an appropriate outfall, and the presence of public and private services.

For a soil field on a poorly draining, silty soil, the installation of a slit drained sand carpet field may be the difference between no use and reliable weekly use. For a site where winter soil temperatures drop to near zero, ryegrass growth will be limited and the lack of recovery from wear will prevent fields sustaining as intensive use as warmer climates. Thus, the sustainable level of use will be less in the lower South Island than the upper North Island.

Existing field layout also needs consideration. The presence of clay cricket blocks on a slit drained sand carpet field compromises the integrity of the sand overlay adjacent to the blocks. At many first class cricket venues, this is managed by covering the block with raised covers through the winter sports season to keep the clay from becoming wet and muddy.

### Material Availability and Design Considerations

The selection of appropriate materials and design of the sand carpet and associated drainage system will affect the performance of the construction. For example, aggregates and sands must be selected for efficient drainage, compatibility between materials, and with consideration to the reliability of supply and cost.

The principle of a sand carpet drainage system is to ensure excess surface water is efficiently transmitted to a sub-surface drainage system or permeable sub-soil layer. It is important to note, however, that there is not one 'recipe' for installing a sand carpet system. With experience, material preferences have changed and specifications for installation have been refined. *By engaging specialist advice, pitfalls encountered in previous sand carpet installations can be minimized and the latest 'sand carpet' technology can be utilized.*

### Timing Construction Work

Construction works may be staged to minimize disruption to field use or to accommodate budget allocations. Play should not commence on a sand carpet field until adequate turf cover has stabilized

the surface following the application of the final sand topdressing. Thus, clubs need to be aware of disruption to their grounds and the requirement for use to be restricted during the first season following construction.

### Maintenance Considerations

While sports administrators may accept the costs of installing a sand carpet field and associated drainage, the additional resources required to manage the field must also be in place. These resources include staff trained in managing sand fields and a higher yearly budget to maintain the field in its intended condition.

### Trained Turf Managers

The main aims of sand-based field maintenance identified in a comprehensive review of sand carpet fields undertaken by Auckland City Council in 1997 were listed as:

- 1) Prevention of excess organic gel accumulation at the surface to maintain the permeability of the sand overlay.
- 2) Retention of turf cover to ensure the stability of the surface is preserved and development of areas of easily erodible sand is avoided.
- 3) Maintenance of a high proportion of

roots in the soil beneath the sand overlay to supply nutrients and water to the turf grass plant and to prevent turf shearing away from the underlying soil during use.

- 4) Ability to monitor pest levels and take appropriate action to control high levels of activity.

- 5) A trained turf manager is required to manage fertility, irrigation, thatch control, physical treatment, repair work, and pest control to achieve the above goals.

### Maintenance Budget

Additional maintenance inputs (costs) for sand fields include: irrigation (if you pay for water), thatch control, implementing a sand topdressing program, physical treatment, pest management (e.g. Earthworm control, *Poa annua* control), and the repair of divot areas through the playing season. The additional cost of maintaining a sand field over a conventional soil field will vary depending on the level of field maintenance prior to sand carpeting and the type of sand carpet field constructed.

### Water Requirements

In regions on the east coast of New Zealand, many soil fields are already irrigated. For other regions, the installation of a sand



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carpet sports field means installing an irrigation system to ensure turf cover is not lost through drier summer months.

In the Auckland region, the use of warm season turf grasses such as cynodon and kikuyu has avoided the need for installing and operating permanent irrigation systems. The use of temporary irrigation systems may still be required for establishment when warm season grasses are initially introduced into the field. In addition, warm season grasses form a turf mat which stabilizes the sand, resulting in less reliance on re-seeding to repair areas of lost cover. Auckland City has also trialed natural zeolite in sand carpet fields to assess its water and nutrient holding benefits.

### Chemical Use Policy

One of the main aims identified in the 1997 Auckland City Council review of sand-based fields was the ability to monitor pest levels and take appropriate action to control high levels of activity. Specifically, earthworm activity can quickly result in the contamination of the surface sand layer. The contaminated surface layer

can then seal up when the field is used in wet conditions. In Auckland City, several fields have deteriorated due to 'No-Spray' policies.

Like other regions, Auckland City has adopted a policy on chemical reduction to reduce and probably eventually stop the use of all chemicals. Alternative management strategies must therefore be found to minimize the use of insecticides on sand-based fields. Such strategies include acidifying the soil profile, the use of lower toxicity chemicals, and shifting to the use of low calcium sands for topdressing.

### Summary

This article has covered key considerations when making the decision to install a slit-drained sand carpet sports field. These include:

*Stakeholders Expectations* such as the desired level of field use and the quality of the playing surface required. Managers must ensure stakeholders' expectations from a sand carpet field are realistic, ensuring for example that clubs are aware of the need to control use.

Auckland City has adopted a policy on chemical reduction to reduce the use of all chemicals. Alternative strategies must be found to minimize the use of insecticides on sand-based fields.

*Construction Considerations* such as the assessment of site characteristics, material availability, and design. Once a specific site is assessed, the cost of construction may be estimated and the time frame for construction work planned. Stakeholders must be made aware of the likely disruption to grounds and restricted use following construction.

*Maintenance Considerations* such as ensuring staff trained in sand field management are available to manage the field and allocating a satisfactory maintenance budget to ensure the continuing success of the upgraded field. ♦

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